

WHAT IS CLAIMED IS:

1. An EGR cooler having a multiplicity of round in section tubes (1) which are juxtaposed spaced apart from each other, with both ends of the tubes (1) leading to a pair of headers (2), with exhaust gases (3) to be cooled circulating within the tubes (1), and with a cooling fluid (4) circulating around outer surfaces of the tubes (1),  
10 wherein the round in section tubes (1) are plastically deformed in one plane crossing centerlines of the tubes (1) such that corrugated exhaust gas flow paths are formed inside the tubes (1).
- 15 2. The EGR cooler of claim 1, wherein the centerlines of the tubes (1) are aligned with each other, with a multiplicity of recessed portions (5) being formed inward from the outer surfaces of the tubes (1) apart from each other in the longitudinal  
20 direction, with the multiplicity of recessed portions being arranged such that inner and outer surfaces of cross sections on the one plane are formed in mountain shapes and that ridgelines (5a) of top portions of the mountains are orthogonal to the one plane, wherein  
25 adjacent recessed portions (5) are formed at positions differing from each other by 180 degrees in the circumferential direction, and wherein

both longitudinal-direction end portions of the tubes (1) are such that round portions (1a) are formed whose cross sections orthogonal to axial lines are round.

5     3.     The EGR cooler of claim 1, wherein the tubes (1) comprise tubes of the same form whose centerlines are formed so as to corrugate within the one plane, with the tubes (1) being disposed in parallel so that phases of the wave forms of the tubes coincide with each other  
10    in each row.

4.     The EGR cooler of claim 3, wherein the tubes (1) are disposed so that the phases of the waves in adjacent rows differ from each other by 180 degrees.

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5.     The EGR cooler of claim 3, wherein planes in the corrugated direction of the centerlines of the tubes (1) are disposed so as to be inclined at the same angle  $\theta$  with respect to a horizontal plane (15).

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6.     The EGR cooler of claim 3, wherein the tubes (1) are formed so as to be face only one side on the plane in which the waves are directed due to balance of gravity of the entire tubes when undersurfaces of two spaced  
25    apart top portions of the wave forms of the centerlines are supported by plate members (6) that are orthogonal to the centerlines.

7. The EGR cooler of claim 3, wherein at undersurface sides of two spaced apart top portions of the wave forms of the centerlines of the tubes (1), the tubes (1) include tube support portions (7) formed in "V" shapes in section.

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8. The EGR cooler of any one of claims 3 to 7, wherein the longitudinal-direction end portions of the tubes (1) have straight centerlines.